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ABSTRACT

This study was conducted to explore the relationship between teaching methods and students' grades at the college level. Subjects, 58 undergraduate students enrolled in 2 introductory education courses, were organized into groups and exposed to one of two teaching methods: the lecture format and reciprocal teaching. Reciprocal teaching engages students acting as teachers and their "students" in four activities--summarizing, clarifying, questioning, and predicting. Multiple choice pre- and posttests measured students' performance in both sections on the two teaching methods. It was found that 70 percent of the participants liked the reciprocal teaching method used in the classroom. Results suggest that, for this sample, there was no relationship between instructional methods and achievement using the two methods and that students' ability could be a more important factor in learning than the teaching method employed. Results also suggest that the level of teacher effectiveness may be consistent across methods and that reciprocal teaching may be qualitatively an effective method of teaching reading comprehension. Based on these results, implications for further research are discussed. (Contains 37 references.) (LL)

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IMPLEMENTING RECIPROCAL TEACHING: WAS IT EFFECTIVE?

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RUNNING HEAD: RECIPROCAL TEACHING

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The purpose of this study was to explore the relationship of teaching methods at the college level with students' grades. When college professors use different methods of instruction, do their students learn more and get better grades? To explore this question, the first author of this study used reciprocal teaching and lecture format in his two undergraduate education courses. The steps of reciprocal teaching used were summarizing, clarifying, questioning, and predicting followed with note copying. It was also intended to survey students' opinion about whether or not they liked practicing reciprocal teaching in the classroom. This study may be described as action research in that it was designed as a personal professional exercise with a limited generalizability of its finding. In general, action research studies are focused on testing the effect of different teaching methods, instructional materials, and classroom organization (Borg, 1987). In other words, they are used to approach specific problems and obtain information about them which will be beneficiary to the curriculum specialist (Hopkins & Antes, 1990).

Many teaching approaches have been developed in education. Some of these approaches are mastery learning (e.g., Bloom, 1984), Hunter's model of teaching (Hunter, 1982), cooperative learning (e.g., Slavin, 1988), and reciprocal teaching (e.g., Brown, 1985). Reviewing the literature has shown that there have been some controversies about

the effectiveness of mastery learning and Hunter's model in enhancing students' achievement and a debate about the effective way to implement cooperative learning. For example, while some research has found that mastery learning produced positive results on students' achievement (Guskey & Gates, 1985; Kulik, Kulik, & Bangert-Drowns, 1990), other studies found no significant increase in students' achievement (Slavin, 1987,1990). Slavin (1989a) stated that there is little evidence to support group-based mastery learning or Madline Hunter's model as methods to increase students achievement. Slavin (1989b) argued for the need for effective programs based on reliable data not just programs that sound good, such as Hunter's model. Also, although there is a consensus that cooperative learning can yield positive results on students' achievement, as indicated by Slavin (1989/1990), there is disagreement between Johnson and Johnson (1989) and Slavin (1989c) on the conditions under which this teaching approach is to be implemented. Slavin (1988) stated that not all forms of cooperative learning are effective. He added that if cooperative learning is to be effective, two conditions must be met: A group goal important to a group of students, and individual accountability. Slavin (1989/1990) mentioned issues that have been discussed in the literature about cooperative learning, some of which are the effectiveness of cooperative learning at all grade levels including college level, and

whether or not group goals and individual accountability are necessary at the college level.

Some research about the effectiveness of reciprocal teaching has indicated that this method of teaching enhanced students' achievement in reading comprehension (e.g., Dermody, 1988; Lysynchuk, Pressley, & Vye, 1990; Palincsar & Klenk, 1992). Lysynchuk, Pressley, and Vye (1990) conducted an experimental study using students in 4th and 7th grades enrolled in different schools to evaluate the effect of reciprocal teaching on students' achievement as measured by standardized comprehension measures. The results indicated that reciprocal teaching improved standardized reading comprehension for students who have problems with comprehension, but are good decoders.

However, other research has shown that there was no difference between students who practiced reciprocal teaching and those who did not (Labercane & Battle, 1987; Rush & Milburn, 1988). Rosenshine and Meister (1991) reviewed the results of nineteen experimental studies on reciprocal teaching. The authors stated that the overall conclusions of all these studies were divided evenly between significant and non-significant results. Rosenshine and Meister, also, found that the results favored those studies when the experimenter-developed tests were used but not when standardized tests were used.

Based on Vygotsky's (1978) concept of "the zone of proximal development" (ZPD), Tharp and Gallimore (1988) have stated that "teaching can be said to occur when assistance is offered at points in the ZPD at which performance requires assistance" (p.31). The kind of help the teacher can offer is in the form of modeling and guided practice, questioning, feedback (Rosenshine, 1983), cognitive instruction (Tharp & Gallimore, 1988) using certain strategies (e.g., Robinson, 1961), and tailoring computer assisted instruction programs to match students' needs (Male, 1988).

Some strategies have embodied all or some of the above activities to help students in academics. For example, it is said that reciprocal teaching uses some activities in the form of modeling and scaffolding in teaching texts. This strategy is suited for less structured material and independent practice where the teacher's role fades away over time and is limited to couching (Palincsar & Brown, 1985).

Reciprocal teaching was originally used with junior high school students who had difficulty in comprehension. This teaching strategy has four activities which are summarizing, questioning, clarifying, and predicting. It is mentioned that these four activities exemplify what expert readers do to comprehend and recall a text. They are a means for readers to track and monitor their learning by applying a concrete model. They also help foster comprehension while reading (Brown,

1985; Brown, Palincsar, & Purcell, 1986; Palincsar & Brown, 1988).

Brown and Campione (1986) have stated that strategies (e.g., reciprocal teaching) are more effective when they are used to teach specific skills, like reading or writing. When applying reciprocal teaching in classroom settings, there is a continuous interaction among the teacher and the students through the processes of dialogue (Palincsar & Brown, 1988). Palincsar and Brown (1988) have mentioned that reciprocal teaching is an activity for problem solving in the area of reading comprehension. It is reported that when students applied this strategy effectively they were able to function independently, improve understanding of text, transfer, and generalize the learned skills to other subject matters (e.g., Palincsar & Brown, 1986).

Besides teaching strategies, there are other factors that may affect students' achievement. For example, past academic performance manifested by grade point average (GPA) is a good predictor of academic success (e.g., Knapp, 1984; Shaughnessy & Evans, 1985). For example, Riggs and Riggs (1990) have found that academic performance may be predictive of the students' success in student teacher programs. Wright, Reilly, and Lytle (1990) have stated that students' GPA is the best predictor of students' academic success at the time of transfer from a two-year community college to a multipurpose university.

METHOD

Subjects

The subjects were 58 undergraduate education students at a midwestern university during the spring semester of 1991. They were enrolled in two introductory special education classes. Thirty students (29 females and 1 male) were in the first section. The other twenty eight students (27 females and 1 male) were enrolled in the second section. All students were preparing to teach at the elementary level. Except for two female students, who worked as teachers aides, the teaching experience of the rest of students was limited to observations in classrooms.

The Steps of Reciprocal Teaching

After the students who were acting as teachers (will be called teaching students) and their students silently read one of the assigned subheadings, the teaching students applied the following steps: First, they summarized the subheading to their students and asked them if they should include additional information in the summary. Second, they asked their students questions about the information read and discussed their responses with them. Third, they clarified ambiguous words and sentences. Finally, they predicted what the next part of the

chapter would be about by giving general information about its content. Students serving as teachers were told that they could give their notes to their students to copy after going through the above steps of teaching. These steps were repeated with every topic.

Instruments.

Three multiple choice tests were given in this study. Test 1 was the pretest given to both sections. Test 2 and test 3 were the posttests. They were used to measure students performance in both sections on the two teaching methods : The lecture type format and reciprocal teaching.

Procedure in the First Section

Students (n=30) in the first section were randomly divided into two groups using a table of random numbers. The two groups were also paired randomly to form 15 subgroups each consisting of one teaching student and one student.

The material used for this study was two chapters from an introductory textbook on special education. The students who served as teachers taught one chapter, while the second chapter was taught by those who served as students. That is, the roles were reversed for the second chapter, such that those who served as teachers for the first

chapter became students and those who served as students became teachers. Those who served as teaching students were given a study guide to cover certain topics in the chapter. They were told that they had two class periods to cover the assigned materials. Each class lasted for fifty minutes (from 1:00 to 1:50 P.M.) The same procedure was used with those who would later be teaching students when teaching the second chapter.

The students were given their instructions on Friday. The whole class period was used to explain and model the steps of reciprocal teaching. The group serving as students was told not to read the assigned material in advance. Before teaching on Monday, the students were reminded of their instructions. During the four class periods, the students' performance was monitored and assistance was given when needed. Students (n=28) in the second section were lectured by the first author for four class periods, two of which were used to cover the first chapter. Each class period was fifty minutes long (from 3:00 P.M. to 3:50 P. M.) and covered the same headings as the first section occasionally using an overhead projector. In the fifth class period, both sections were given a thirty item multiple choice test (test 2). The test items were obtained from the test bank that accompanied the special education book.

Procedure in the Second Section

The procedure employed in the first section was used with students (n=28) in the second section in the next six class periods after taking the test. They were randomly divided into two groups using a table of random numbers. The two groups were randomly paired to form 14 subgroups. Each subgroup consisted of one teaching student and one student.

Two new chapters were used from the same introductory book on special education in this phase of the study. Three class periods were devoted to covering the assigned materials in each of the two new chapters.

The students' application of the steps of reciprocal teaching was monitored and assistance was given when needed during the six class periods of teaching. While these students (n=28) were using the steps of reciprocal teaching, students (n=30) in the first section were taught by the same instructor, sometimes using an overhead projector to cover the relevant material. In the seventh class period, a test of thirty multiple choice items was given to both sections (test 3). The test items were obtained from the test bank that accompanied the special education book.

Other Activities

Although students (N=58) were told not to skip classes while conducting the study, some of them did in both sections because of extraordinary circumstances (e.g., weather and illness). When this happened, the arrangement was to assign the students randomly to other teaching students if their teaching students were absent. However, if the students were absent, their teaching students were randomly assigned to other groups where they participated in the teaching activity.

At the end of this study, students in both classes were asked to state whether or not they liked the reciprocal teaching method as compared to the traditional lecturing format.

Results

The homogeneity of variances was tested by computing an F-ratio to determine if there was a significant difference between the variances on the pretest as well as the variances on posttests (test 2 and test 3). The F-value indicated no significant difference between the two pretest variances (F=1.35; ns), and the variance on posttests (F=1.41; ns) (see Table 1).

Simultaneous multiple regression was conducted in which test 2 and test 3 (which represent the students' performance on reciprocal

teaching and lecture format) were the dependent variables. Variables entered into the equation as predictors were test 1 (pretest), teaching methods (lecture or reciprocal teaching), and GPA. Test 1 and GPA were used to take into account any differences associated with students' ability. The multiple regression equation predicting test 2 and test 3, representing the two teaching methods, was significant at .005 level. When test 2, which contains scores from applying reciprocal teaching and lecturing, was the criterion variable, GPA was the only variable that accounts for a significant amount of unique variance. However, test 1 and GPA predicted a significant amount of unique variance for test 3, which also contains scores from using the two teaching methods (see Table 2).

The percentage of students who like practicing reciprocal teaching was calculated. It was found that 70% of the participants liked the reciprocal teaching method used in the classroom.

DISCUSSION

The data obtained indicated that for this sample there was no relationship between instructional methods and achievement using the two teaching methods. The results suggest that the ability of students could be a more important factor in students' learning than the methods of teaching employed by the instructor. Also, the results

raise the possibility that the level of effectiveness of a teacher may be somewhat consistent across methods, such that a teacher who is a good lecturer may also be good at implementing reciprocal teaching.

Even though there was no significant difference, with regard to students' achievement scores, between reciprocal teaching technique and standard lecture format used to teach the two classes, reciprocal teaching may be qualitatively an effective method of teaching reading comprehension. The advantage noticed when applying reciprocal teaching was that some students discussed the topics on hand by raising many questions that were not just factual, calling up real examples from their experiences and observations of those who have disabilities. It seems that the active involvement of students has promoted a natural way of learning. Similar findings were reported by Benware and Deci (1984) who found that college freshmen were more intrinsically motivated and actively engaged when they learned the material with expectation of teaching it than students who learned the material in order to be tested. Moreover, the instructor using the reciprocal teaching method had more time to assist students individually.

Although some students asked for assistance in clarifying some terminology and unclear sentences, reciprocal teaching provided all of them with a model of how to approach the assigned material with

minimum help and less anxiety. Also, using reciprocal teaching created no dramatic negative effect on students' grades. That is, applying reciprocal teaching did no lower students' grades.

Some of the students' reactions to the present study were that they paid attention to details, read the chapter more than usual, prepared better for class, and had a good understanding of the material presented in the book. However, some of their concerns were that some students who were acting as teachers lacked the outside knowledge to enhance the presentation of facts, they lost interest after practicing reciprocal teaching for a while, and they were not sure about whether or not they would use it in their classrooms. Similar findings were reported by Mosenthal, Schwartz, and Maclsaac (1992) who used reciprocal teaching with preservice education major teachers. The authors stated that the participants in the study indicated that reciprocal teaching helped them understand and focus on the presented material. However, not all the participants in the study liked reciprocal teaching; and some of those who did like reciprocal teaching were not sure if they will implement this technique in their classrooms.

There are two possibilities for not finding significant quantitative results to support reciprocal teaching. The first one is the measurement method used to obtain the data. It might not have been

sensitive enough to this type of teaching. The measure used (i.e., multiple choice tests) was probably more amenable to the lecture type teaching method. Therefore, a new measure may be needed for this type of teaching. The second possibility is that reciprocal teaching might not have been good for the materials covered in the chapters that the students studied. The limitation of this study is that its finding is tentative. Additional research is needed to clarify the results. Also, the number of students used in this study was small. Therefore, its finding may not generalize to other settings. Although experimental research techniques were used here, this study may be described as an action research study.

It is a goal in education to find a teaching method that applies to every subject matter in schools where every student performs up to their potential. Realistically, this objective is yet to be achieved and may not be possible. Therefore, it should be emphasized that, so far, there is no one way for effective teaching. Adopting one method to the degree of excluding others might hinder teachers' choice and innovation in developing good and effective teaching techniques that might improve students' achievement. However, good teaching practices involves implementing principles that are found to be important in teaching. Reciprocal teaching is an example of a good teaching practice. We need additional research at the college level to find out how it can best be

used with this population of young adults.

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TABLE 1

Test of homogeneity of variances on pretest and posttests

Variables	Section	Mean	Variance	F
Pretest	1(n=30)	20.97	14.31	1.35
Pretest	2(n=28)	21.89	10.62	
Posttests				
Lecturing	1&2(N=58)	23.95	16.16	1.41
Recip.Teach .	1&2(N=58)	23.72	11.50	

Note: No significant difference between the variances on the pretest as well as the variances on the posttests was found

TABLE 2

Beta weights, multiple R, R square, adjusted R square, t, and overall F values of the simultaneous multiple regression for test 2 and test 3 estimated from methods of teaching, GPA, and Test 1

Predictor	Beta	t	Multiple R	R Square	Adj.R.Squ.	Overall F
Test 2 as the Criterion Variable						
Methods	-.054	-.488				
GPA	.493	4.042***				
Test 1	.204	1.667				
Constant		4.454***				
Overall			.61	.37	.33	10.56***
Test 3 as the Criterion Variable						
Methods	.058	.546				
GPA	.433	3.736***				
Test 1	.339	2.926***				
Constant		4.737***				
Overall			.66	.43	.40	13.69***

Note: *p<.05 **p<.01 ***p<.005